

ceptibility of the lung to infection at this stage of the life history appears very significant, especially in view of the fact recorded in another paper from this laboratory that the vitamin-A-content of lung tissue varies with that of the food.

Especially noteworthy was the repeated observation of young females growing normally and presenting every appearance of good health throughout youth on a diet low in vitamin A, but failing utterly to succeed in the rearing of a second generation, and showing a strong tendency to break down in health at an age at which they should have been in the prime of life.

Thus it is clearly shown that vitamin A is an even more important factor in the chemistry of food and nutrition than has previously been appreciated, for it must be supplied in liberal proportion not only during growth but in the food of the adult as well, if a good condition of nutrition and a high degree of health and vigor are to be maintained.

38 (2561)

Oil activated by irradiation. II. Separation into an antirachitic and an inactive fraction.

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In previous communications^{1, 2} it has been reported by us that inert vegetable oils, such as linseed or cotton seed oil, can be endowed with antirachitic properties by means of irradiation with ultraviolet rays, and furthermore that the same property can be communicated to lettuce or to growing wheat by this form of radiation.

It is well-known that the antirachitic principle of cod liver oil is contained in its unsaponifiable fraction and that the saponifiable fraction is inert (Zucker). It seemed therefore of interest to

^{1, 2} Hess, A. F., and Weinstock, M., *Proc. Soc. Exp. Biol. and Med.*, 1924, xxii, 6, 5.

ascertain whether the activated vegetable oil could be separated into similar fractions. A preliminary test showed that the unsaponifiable fraction of cotton seed oil was unable to protect rats which were placed on a low phosphorus rickets-producing diet. the same was found to be true in respect to linseed oil. When, however, irradiated linseed oil was fractioned, it was found that 0.1 gm. of the unsaponifiable fraction was sufficient to confer protection. The criterion of its efficacy was the absence of microscopic lesions at the costochondral junctions. Furthermore the blood of these rats contained more than twice as much inorganic phosphorus as the blood of similar rats which had received the non-irradiated oil. It would seem that irradiation of the vegetable oil had produced a substance similar in its properties to that in cod liver oil.

39 (2562)

Rate of metabolism and sex determination in Cladocera.

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Cladocera reproduce mostly by parthenogenesis, and for long periods of time only female young may appear. Sometimes, however, males arise from parthenogenetic eggs, which eggs are indistinguishable from the parthenogenetic eggs ordinarily giving rise to females. At times sexual eggs appear and, if pairing occurs, these larger eggs pass into specially modified egg cases, the ephippia, within which they are cast off, undergo the earlier developmental stages, and enter a resting or latent period. This latent period is much prolonged (probably for months or even years with some forms) unless the eggs undergo desiccation or freezing or both. After desiccation or freezing if returned to water at 10° to 25° C. the sexual eggs develop into female young.

Experience in rearing several species of Cladocera lead the senior writer to conclude¹ that different environmental conditions are responsible for the occurrence of parthenogenetic females, or

¹ Banta, Arthur M., *PROC. SOC. EXP. BIOL. AND MED.*, 1916, xiv, 3.